

Amendments to the Claims:

Please cancel claims 1 - 14, 16 and 24 without prejudice or disclaimer of the subject matter thereof, please rewrite claims 15 and 17 - 19 in independent form, amend claims 20 - 23 and add new claims 25 - 36 as follows.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 - 14 (canceled)

15. (currently amended) A liquid crystal module ~~according to claim 14, for displaying video data, comprising:~~

a liquid crystal panel controlling a transparency of a liquid crystal interposed between image element electrodes and facing electrodes in response to a write voltage applied to said image element electrodes;

a timing control substrate equipped with a control circuit and a power supply circuit supplying power, said control circuit receiving and converting a video signal and a sync signal or a control signal, into a signal for said liquid crystal panel;

a scan substrate equipped with a scan driver circuit for supplying a selection voltage to said image element electrodes, via scan signal lines, based on a signal output from said timing control substrate; and

a data substrate equipped with a data driver circuit for supplying said write voltage to said image element electrodes, via data signal lines;

wherein said timing control substrate further includes a correction circuit for receiving a gradation signal of video data, for generating a correction signal to

increase luminance if a post-change gradation level of said gradation signal is greater than a pre-change gradation level of said gradation signal or for generating a correction signal to reduce luminance if said post-change gradation level of said gradation signal is less than said pre-change gradation level of said input gradation signal, and for correcting said post-change gradation signal using said correction signal;

wherein said correction circuit generates said correction signal to add a luminance that enables cancellation of a luminance deficit caused by a response delay in said liquid crystal panel if said gradation level of said post-change frame gradation signal is greater than said gradation level of said pre-change frame gradation signal;

wherein said correction circuit generates said correction signal to subtract luminance that enables cancellation of a luminance surplus caused by a response delay in said liquid crystal panel if said gradation level of said post-change frame gradation signal is less than said gradation level of said pre-change frame gradation signal;

wherein a target luminance which is represented on said liquid crystal panel based on said corrected post-change gradation signal overshoots a luminance to be represented on said liquid crystal panel based on a non-corrected said post-change gradation signal if said post-change gradation level of said gradation signal is greater than said pre-change gradation level of said gradation signal;

wherein said target luminance which is represented on said liquid crystal panel based on said corrected post-change gradation signal undershoots a luminance to be represented on said liquid crystal panel based on a non-corrected

post-change gradation signal if said post-change gradation level of said gradation signal is less than said pre-change gradation level of said gradation signal;

wherein said correction circuit generates said correction signal based on a correction data table that pre-defines correction levels of said correction signal based on said gradation level of said post-change gradation signal and said gradation level of said pre-change gradation signal, and wherein said correction circuit generates correction levels of said correction signals not defined in said correction data table based on said correction signal correction levels predefined in said correction data table; and

wherein, in said correction circuit, said correction level of said correction signal that is not pre-defined is a correction level contained in a range of +/-20% of a correction data DL obtained using

$$DL = \begin{cases} \text{if } (TLE_{j+1} - TLE_j)(LS - TLS_i) + (TLS_{i+1} - TLS_i)(LE - TLE_{j+1}) \leq 0: \\ TDL_{i,j} + \frac{TDL_{i+1,j} - TDL_{i,j}}{TLS_{i+1} - TLS_i}(LS - TLS_i) + \frac{TDL_{i,j+1} - TDL_{i,j}}{TLE_{j+1} - TLE_j}(LE - TLE_j) \\ \text{else} \\ TDL_{i+1,j+1} - \frac{TDL_{i+1,j+1} - TDL_{i,j+1}}{TLS_{i+1} - TLS_i}(TLS_{i+1} - LS) - \frac{TDL_{i+1,j+1} - TDL_{i+1,j}}{TLE_{j+1} - TLE_j}(TLE_{j+1} - LE) \end{cases}$$

(where DL represents correction data, i represents a pre-change gradation table index, j represents a post-change gradation table index, TLS represents pre-change gradation table, TLE represents post-change gradation table, TDL represents correction table data, LS represents pre-change gradation data ( $TLS_i \leq LS < TLS_{i+1}$ ), and LE represents post-change gradation table ( $TLE_i \leq LE < TLE_{i+1}$ )).

Claim 16 (canceled)

17. (Currently Amended) A liquid crystal module ~~according to claim 16~~ for displaying video data, comprising:

a liquid crystal panel controlling a transparency of a liquid crystal interposed between image element electrodes and facing electrodes in response to a write voltage applied to said image element electrodes;

a timing control substrate equipped with a control circuit and a power supply circuit supplying power, said control circuit receiving and converting a video signal and a sync signal or a control signal, into a signal for said liquid crystal panel;

a scan substrate equipped with a scan driver circuit for supplying a selection voltage to said image element electrodes, via scan signal lines, based on a signal output from said timing control substrate; and

a data substrate equipped with a data driver circuit for supplying said write voltage to said image element electrodes, via data signal lines;

wherein said timing control substrate further includes a correction circuit for receiving a gradation signal of video data, for generating a correction signal to increase luminance if a post-change gradation level of said gradation signal is greater than a pre-change gradation level of said gradation signal or for generating a correction signal to reduce luminance if said post-change gradation level of said gradation signal is less than said pre-change gradation level of said input gradation signal, and for correcting said post-change gradation signal using said correction signal;

wherein said correction circuit generates said correction signal to add a luminance that enables cancellation of a luminance deficit caused by a response

delay in said liquid crystal panel if said gradation level of said post-change frame gradation signal is greater than said gradation level of said pre-change frame gradation signal;

wherein said correction circuit generates said correction signal to subtract luminance that enables cancellation of a luminance surplus caused by a response delay in said liquid crystal panel if said gradation level of said post-change frame gradation signal is less than said gradation level of said pre-change frame gradation signal;

wherein a target luminance which is represented on said liquid crystal panel based on said corrected post-change gradation signal overshoots a luminance to be represented on said liquid crystal panel based on a non-corrected said post-change gradation signal if said post-change gradation level of said gradation signal is greater than said pre-change gradation level of said gradation signal;

wherein said target luminance which is represented on said liquid crystal panel based on said corrected post-change gradation signal undershoots a luminance to be represented on said liquid crystal panel based on a non-corrected post-change gradation signal if said post-change gradation level of said gradation signal is less than said pre-change gradation level of said gradation signal;

wherein said correction circuit generates said correction signal based on a slope data table pre-defining correction levels of said correction signal based on a slope in a change from said pre-change gradation signal gradation level to said post-change gradation signal gradation level and said pre-change gradation signal gradation level; and

wherein, in said correction circuit, a parameter  $\gamma$  representing the relation between said gradation levels and luminance is in a range of 1.8 – 2.2, a linear

approximation with a bent-line graph is made of a relation between said slope of change and said correction level of said correction signal where a bend is positioned at an intermediate point between said pre-change gradation level of said gradation signal and a maximum gradation level if there is an increase in said gradation level, and, if there is a decrease in said gradation level, said correction signal correction level is a level contained in a range of +/-20% of a correction data DL obtained based on said slope data table and derived using

$$DL = \begin{cases} \text{if } LE < LS: M1_i(LE - LS) \\ \text{elseif } LS \leq LE < \frac{LMAX + LS}{2}: M2_i(LE - LS) \\ \text{elseif } LE \geq \frac{LMAX + LS}{2}: M2_i \frac{LMAX - LS}{2} - M3_i(LE - \frac{LMAX + LS}{2}) \end{cases}$$

(where DL represents correction data, i represents a line slope table index, M1 represents line slope table data (decreasing change), M2, M3 represents broken line slope table data (increasing change), LMAX represents maximum gradation data, LS represents pre-change gradation data, and LE represents post-change gradation data).

18. (Currently Amended) A liquid crystal module ~~according to claim 16~~ for displaying video data, comprising:

a liquid crystal panel controlling a transparency of a liquid crystal interposed between image element electrodes and facing electrodes in response to a write voltage applied to said image element electrodes;

a timing control substrate equipped with a control circuit and a power supply circuit supplying power, said control circuit receiving and converting a video signal and a sync signal or a control signal, into a signal for said liquid crystal panel;

a scan substrate equipped with a scan driver circuit for supplying a selection voltage to said image element electrodes, via scan signal lines, based on a signal output from said timing control substrate; and

a data substrate equipped with a data driver circuit for supplying said write voltage to said image element electrodes, via data signal lines;

wherein said timing control substrate further includes a correction circuit for receiving a gradation signal of video data, for generating a correction signal to increase luminance if a post-change gradation level of said gradation signal is greater than a pre-change gradation level of said gradation signal or for generating a correction signal to reduce luminance if said post-change gradation level of said gradation signal is less than said pre-change gradation level of said input gradation signal, and for correcting said post-change gradation signal using said correction signal;

wherein said correction circuit generates said correction signal to add a luminance that enables cancellation of a luminance deficit caused by a response delay in said liquid crystal panel if said gradation level of said post-change frame gradation signal is greater than said gradation level of said pre-change frame gradation signal;

wherein said correction circuit generates said correction signal to subtract luminance that enables cancellation of a luminance surplus caused by a response delay in said liquid crystal panel if said gradation level of said post-change frame

gradation signal is less than said gradation level of said pre-change frame gradation signal;

wherein a target luminance which is represented on said liquid crystal panel based on said corrected post-change gradation signal overshoots a luminance to be represented on said liquid crystal panel based on a non-corrected said post-change gradation signal if said post-change gradation level of said gradation signal is greater than said pre-change gradation level of said gradation signal;

wherein said target luminance which is represented on said liquid crystal panel based on said corrected post-change gradation signal undershoots a luminance to be represented on said liquid crystal panel based on a non-corrected post-change gradation signal if said post-change gradation level of said gradation signal is less than said pre-change gradation level of said gradation signal;

wherein said correction circuit generates said correction signal based on a slope data table pre-defining correction levels of said correction signal based on a slope in a change from said pre-change gradation signal gradation level to said post-change gradation signal gradation level and said pre-change gradation signal gradation level; and

wherein, in said correction circuit, a parameter  $\gamma$  representing the relation between said gradation levels and luminance is in a range of 1.8 - 2.2, a quadratic approximation is made of a relation between said slope of change and said correction level of said correction signal where a center line is positioned at an intermediate point between said pre-change gradation level of said gradation signal and a maximum gradation level if there is an increase in said gradation level, and, if there is a decrease in said gradation level, said correction signal correction level is a level contained in a range of +/-20% of a correction data DL obtained derived using



$$DL = \begin{cases} \text{if } LE < LS: A1_i(LE^2 - LS^2) \\ \text{else if } LS \leq LE: A2_i\left\{\left(LE - \frac{LS + LMAX}{2}\right)^2 - \left(\frac{LS - LMAX}{2}\right)^2\right\} \end{cases}$$

(where DL represents correction data, i represents a quadratic coefficient table index, A1 represents quadratic coefficient table data (decreasing change), A2 represents quadratic coefficient table data (increasing change), LMAX represents maximum gradation data, LS represents pre-change gradation data, and LE represents post-change gradation data) and based on a quadratic coefficient data table determined by said pre-change gradation level and obtained by approximating a relation between said slope of change and said correction signal correction level with a quadratic function having a center line at a line at a minimum gradation level.

19. (currently amended) A liquid crystal module ~~a according to claim 13~~ for displaying video data, comprising:

a liquid crystal panel controlling a transparency of a liquid crystal interposed between image element electrodes and facing electrodes in response to a write voltage applied to said image element electrodes;

a timing control substrate equipped with a control circuit and a power supply circuit supplying power, said control circuit receiving and converting a video signal and a sync signal or a control signal, into a signal for said liquid crystal panel;

a scan substrate equipped with a scan driver circuit for supplying a selection voltage to said image element electrodes, via scan signal lines, based on a signal output from said timing control substrate; and

a data substrate equipped with a data driver circuit for supplying said write voltage to said image element electrodes, via data signal lines;

wherein said timing control substrate further includes a correction circuit for receiving a gradation signal of video data, for generating a correction signal to increase luminance if a post-change gradation level of said gradation signal is greater than a pre-change gradation level of said gradation signal or for generating a correction signal to reduce luminance if said post-change gradation level of said gradation signal is less than said pre-change gradation level of said input gradation signal, and for correcting said post-change gradation signal using said correction signal;

wherein said correction circuit generates said correction signal to add a luminance that enables cancellation of a luminance deficit caused by a response delay in said liquid crystal panel if said gradation level of said post-change frame gradation signal is greater than said gradation level of said pre-change frame gradation signal;

wherein said correction circuit generates said correction signal to subtract luminance that enables cancellation of a luminance surplus caused by a response delay in said liquid crystal panel if said gradation level of said post-change frame gradation signal is less than said gradation level of said pre-change frame gradation signal;

wherein a target luminance which is represented on said liquid crystal panel based on said corrected post-change gradation signal overshoots a luminance to be represented on said liquid crystal panel based on a non-corrected said post-change gradation signal if said post-change gradation level of said gradation signal is greater than said pre-change gradation level of said gradation signal;

wherein said target luminance which is represented on said liquid crystal panel based on said corrected post-change gradation signal undershoots a luminance to be represented on said liquid crystal panel based on a non-corrected post-change gradation signal if said post-change gradation level of said gradation signal is less than said pre-change gradation level of said gradation signal; and

wherein, in said correction circuit, said correction signal correction level is a level contained in a range of +/-20% of a correction data DL obtained based on a filter coefficient and a transfer function of a finite impulse filter and derived using

$$H(z) = 1 + K(1 - z)$$

$$K = \frac{\alpha \tau}{T_f}$$

(where H(z) represents a transfer function, K represents a filter coefficient, T<sub>f</sub> represents one frame interval, τ represents a response-time constant, and alpha represents a correction coefficient).

20. (currently amended) A liquid crystal module according to claim-~~13~~ 15, wherein said correction circuit includes a selection switch for selecting based on optical response characteristics or gradation signal optical characteristics of said liquid crystal.

21. (currently amended) A liquid crystal module according to claim ~~13~~ 15, wherein said correction circuit includes a selection circuit for selecting a degree of correction.

22. (currently amended) A liquid crystal module according to claim ~~13~~ 15, wherein said correction circuit generates a correction signal providing compensation so that a luminance deficit or surplus rate from said correction signal is in a range of -30% to 10% for intermediate gradations in three-frame intervals.

23. (currently amended) A liquid crystal module according to claim ~~13~~ 15, wherein, said correction circuit includes an edge enhancement module enhancing edges of images displayed on said liquid crystal panel, said edge enhancement module receiving correction data from said data correction module and enhancing edges.

Claim 24 (canceled)

25. (new) A liquid crystal module according to claim 17, wherein said correction circuit includes a selection switch for selecting based on optical response characteristics or gradation signal optical characteristics of said liquid crystal.

26. (new) A liquid crystal module according to claim 17, wherein said correction circuit includes a selection circuit for selecting a degree of correction.

27. (new) A liquid crystal module according to claim 17, wherein said correction circuit generates a correction signal providing compensation so that a luminance deficit or surplus rate from said correction signal is in a range of -30% to 10% for intermediate gradations in three-frame intervals.

28. (new) A liquid crystal module according to claim 17, wherein, said correction circuit includes an edge enhancement module enhancing edges of images displayed on said liquid crystal panel, said edge enhancement module receiving correction data from said data correction module and enhancing edges.

29. (new) A liquid crystal module according to claim 18, wherein said correction circuit includes a selection switch for selecting based on optical response characteristics or gradation signal optical characteristics of said liquid crystal.

30. (new) A liquid crystal module according to claim 18, wherein said correction circuit includes a selection circuit for selecting a degree of correction.

31. (new) A liquid crystal module according to claim 18, wherein said correction circuit generates a correction signal providing compensation so that a luminance deficit or surplus rate from said correction signal is in a range of -30% to 10% for intermediate gradations in three-frame intervals.

32. (new) A liquid crystal module according to claim 18, wherein, said correction circuit includes an edge enhancement module enhancing edges of images

displayed on said liquid crystal panel, said edge enhancement module receiving correction data from said data correction module and enhancing edges.

33. (new) A liquid crystal module according to claim 19, wherein said correction circuit includes a selection switch for selecting based on optical response characteristics or gradation signal optical characteristics of said liquid crystal.

34. (new) A liquid crystal module according to claim 19, wherein said correction circuit includes a selection circuit for selecting a degree of correction.

35. (new) A liquid crystal module according to claim 19, wherein said correction circuit generates a correction signal providing compensation so that a luminance deficit or surplus rate from said correction signal is in a range of -30% to 10% for intermediate gradations in three-frame intervals.

36. (new) A liquid crystal module according to claim 19, wherein, said correction circuit includes an edge enhancement module enhancing edges of images displayed on said liquid crystal panel, said edge enhancement module receiving correction data from said data correction module and enhancing edges.